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May 27, 1998

In the matter of:

A petition by the LMCC about allocation
of spectrum for the Private Mobile Radio Services.

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RM-9267

FORMAL COMMENTS CONCERNING
A PETITION FOR RULE MAKING
SUBMITTED BY THE
LAND MOBILE COMMUNICATIONS COUNCIL (LMCC)

Office of the Secretary
Federal Communications Commission
Room 222
1919 M. Street NW
Washington, D.C. 20554

To Whom It May Concern:

I wish to formally voice my opposition to certain aspects of RM-9267, a proposal concerning requested PMRS spectrum allocations. My oppositions are specifically to the reference in paragraph 73 (part V, section A, subpart i) proposing that amateur allocations at 420-430 and 440-450 MHz become secondary to the PRMS.

The past importance of amateur radio in public service cannot be overstated: Amateur radio operators have provided and continue to provide essential communications during times of public emergency. Additionally, the intrinsic "priority access" (as discussed in paragraph 55 of the proposal.) of the amateur service allows the alert amateur to inform and/or communicate with the appropriate authorities, particularly during times of public emergency when the volunteer amateur radio emergency services spring into action.

The workability of placing the amateur service in a status secondary to the PMRS on the 420-430 and 440-450 MHz seems dubious at best. Although sharing of the affected frequencies is implied, there is not the slightest hint on how a workable system might function. It seems likely that, given the "gaseous" nature of the industry, all available spectrum will quickly be occupied and the "secondary" nature of the amateur allocation will be only of academic interest: Amateurs would simply be crowded out of existence on those sub-bands.

It may not be immediately obvious to the causal observer how heavily amateurs use the proposed frequency segments. The 440-450 portions is, in most parts of the country, quite heavily loaded with repeaters and simplex operation while the 420-430 portion (where available) is heavily used for system linking, low, medium and high-speed data, and television. The wide-area and transient nature of much amateur radio operation tends to allow a relatively small number of systems to cover very large geographical areas – a great benefit when it comes to providing public service and disaster relief communications.

The LMCC proposal suggests that the 430-440 MHz segment is that which is most valuable to the amateurs, as that is the test bed for emerging technologies. While this may be the case, it could be

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suggested that this area is less attractive to the industry because of the international nature of its use (i.e. amateur satellites, space communications, etc.) and reallocation is thereby greatly complicated. I argue that if the current amicable secondary status of amateurs on these sub-bands is changed, amateurs will necessarily have to relocate their existing systems in order to maintain service, as best they can, to the remaining portion of the band at 430-440 MHz. The resultant congestion would most certainly diminish its attractiveness and usefulness for existing and emerging technologies – particularly those that are broadband in nature. This would seem to contradict the assertion of the LMCC that amateurs would benefit by the infusion of newer technologies.

By its own admission the LMCC states that the initial uses of these frequencies would simply use current, off-the-shelf equipment and standard modulation schemes. Frequently, the LMCC refers to the need to adapt newer technologies in order to promote spectrum conservation. It seems to me that the industry would be better served in the long run if it were to petition for, and implement the use of these technologies sooner than later using the pressure within existing allocations as leverage.

Being an amateur radio operator and an engineer with ties to the land-mobile industry, I must also question the technical soundness of the suggested spectrum-conservation measures proposed in the document. As a case in point the LMCC proposes 12.5 and 6.25 kHz FM channels to be increasingly utilized. The LMCC also points out the degradation in operational performance that these newer standards provide. While the popular industry trend is to go to increasingly all digital signals, I do recognize that this is not a panacea: In certain applications (such as handy-talkie and dense urban environments) effects such as multipath distortion limit the effectiveness of such modulation schemes. A technically superior modulation scheme in almost all respects would be ACSSB (Amplitude Companded Single Sideband) with its pilot tone. This was proposed as one of the uses for the now-reallocated 220-222 MHz amateur band segment and, to my knowledge, no real attempt was made in the industry to implement this mode or to petition the appropriate authorities to allow its adoption.

ACSSB as the advantage of occupying less bandwidth than any practical FM signal. Amateurs and other users have been able to use 3 kHz channel spacing very successfully for voice-grade circuits using traditional SSB, but 5 kHz spacing would certainly be reasonable. It is far more robust than any current digital standard in the presence of interference and time and frequency-domain distortion. For a given amount of power it provides better recovered audio carrier-to-noise ratio than 6.25 kHz FM, and, in the case of battery-powered equipment, it can greatly reduce current consumption when transmitting owing to the lower effective duty cycle, when compared to FM. The nature of SSB (and ACSSB, certainly) also makes it much less affected by multipath distortion. Finally, recent advances in DSP (Digital Signal Processing) which can already be seen in commercially-available amateur radio gear further enhance the communications quality of SSB-type communication modes.

It might be argued that the technical requirements for implementing a system such as ACSSB would be excessive, but I counter that by pointing out that off-the-shelf components exist at this moment: Synthesizers are arguably less-expensive than multi-channel discrete crystal oscillators ever were and can be combined with relatively low-complexity DSP to assist in frequency control, companding, and noise reduction. Using direct conversion, quadrature and phasing schemes along with DSP the equipment can actually be simplified greatly over what it is now. Much of the existing test equipment can already accommodate the requirements of a system like ACSSB. The argument that such a system would be incompatible with existing technology is a specious one since the narrower FM channels and current digital schemes are intrinsically incompatible with more traditional technology already.

Finally, I do acknowledge the point made by the LMCC that in partial compensation of the “constriction” of the 420-450 MHz frequency range (see paragraph 78) amateurs be allocated, for example, 1390-1395 and 1427-1432 MHz. However, I do not believe that 10 MHz microwave spectrum to be *at all* equivalent to 20 MHz of UHF spectrum. The LMCC itself points out the advantage of the 420-450 MHz spectrum over portions of spectrum in that there is easily adaptable commercial equipment already available. Since the amateur radio service is, by definition, a volunteer service, it would be unreasonable to expect amateurs

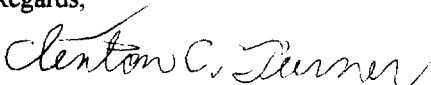
to attempt to relocate existing services to other frequency ranges, particularly if "easily adaptable" equipment were unavailable. Additionally, the characteristics of the UHF frequencies lend themselves more readily to the sort of services that amateurs provide currently on those bands than do the microwave frequencies. The LMCC is clearly aware of this as evidenced by their desire for these frequencies.

As an amateur radio operator, I spend much of my time in the hobby in the design, development, and construction of systems that utilize both old and new technologies. I find the 420-450 MHz amateur band to be one of the best ones for testing and proving (or disproving) new designs. I am frequently involved in public service events, many of which involve the potentially affected segments. The effective loss of the 420-430 and 440-450 MHz segments would impair my ability as an amateur radio operator to contribute to the "state of the art" and provide these public services. These two points are specifically spelled out in the "basis and purpose" clause at the beginning of the FCC Part 97 rules governing the amateur radio service.

Conclusion:

- 1) In the absence of a viable "sharing plan" I believe that changing the current status of the Amateur Radio Service in the 420-430 and 440-450 MHz ranges from being secondary to Federal use to being secondary to the PMRS would effectively result in the loss of these frequencies to the Amateur Radio Service.
- 2) The loss of 420-430 and 440-450 MHz would seriously impair the ability of the Amateur Radio Service to perform its public duties during times of civil emergency.
- 3) The loss of 420-430 and 440-450 MHz to the Amateur Radio Service would be a detrimental to its contribution in the advancement of the state of the art of communications by removing frequencies useful for experimentation and concentrating existing needed services into the remaining segments, displacing those experimental systems.
- 4) The continued insistence of the LMCC that narrow-band FM schemes be used when other modulation schemes (such as ACSSB) should be implemented.
- 5) I respectfully request that, if and when federal usage is phased out, the relevant portions of the 420-450 MHz amateur band be *returned* to their original primary status.

Regards,


Clinton C. Turner, KA7OEI